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A COMPARATIVE EVALUATION OF THE GROUP IV PERSONNEL ASSIGNED TO THE USS CATSKILL

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ASSIGNED TO THE USS CATSKILL

by

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August 1968

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SUMMARY AND CONCLUSIONS

Problem

The purpose of this investigation is to assess the capabilities and utilization of a sample of Group IV personnel assigned to an operational Navy vessel. This initial report provides evaluative information concerning the aptitudinal characteristics, training achievement, and early shipboard performance of Group IV personnel assigned to the mine countermeasures support ship USS CATSKILL.

Background

In accordance with revised standards which provide for induction of lower aptitude personnel, the Navy, as well as the other military services is accepting greater numbers of Mental Group IV personnel (AFQT scores 10 through 30). Accommodation of this influx of marginal personnel into the Navy places demands upon existing training programs, assignment procedures, and job classifications. The adequacy of present systems depends, in part, upon the extent to which the capabilities of marginal personnel can be fully developed and effectively utilized within the total operational requirements of the fleet. This initial research report provides a comparative evaluation of the Group IV and non-Group IV personnel assigned to an operational Navy vessel, USS CATSKILL (MCS-1).

Approach

The research procedures involved assessment of 116 Group IV and 82 non-Group IV unrated CATSKILL seamen with respect to aptitudes, training achievement, and preliminary shipboard performance. Research data were obtained from service records, training course records, and interviews with supervisors.

Conclusions

This report provides descriptive sample data, training achievement information, and results of preliminary performance evaluations. Based upon initial comparative evaluations of the Group IV and non-Group IV samples, the following conclusions are presented. These conclusions must be qualified in terms of the difference between samples in average length of service.

1. The Group IV sample had, on the average, a lower chronological age, shorter length of formal education, and a shorter length of completed enlisted service at the time of assessment than the non-Group IV sample.

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A COMPARATIVE EVALUATION OF THE GROUP IV PERSONNEL ASSIGNED TO THE USS CATSKILL

A. Introduction

In accordance with revised standards which provide for induction of lower aptitude personnel, the Navy, as well as the other military services, is now accepting greater numbers of Mental Group IV personnel (AFQT scores from 10 through 30). Many of these Group IV personnel would not have been qualified for enlistment under previous standards. Accommodation of this influx of marginal personnel into the Navy places demands upon existing training programs, assignment procedures, and job classifications. The adequacy of present systems depends, in part, upon the extent to which the capabilities of marginal personnel can be fully developed and effectively utilized within the total operational requirements of the fleet.

The present investigation provides an evaluation of the aptitudinal characteristics, training achievement, and shipboard performance of a sizable sample of Group IV personnel assigned to an operational Navy vessel. The mine countermeasures support ship USS CATSKILL, MCS-1, which was recommissioned October 1967, was assigned a crew of 455 men including approximately 270 unrated enlisted personnel. About 50% of the unrated personnel were in the Mental Group IV category. Both Group IV and non-Group IV men were assigned to a variety of typical shipboard jobs utilizing unrated seamen. Other job assignments which are unique to the mine countermeasures mission, include serving as crew members for the CATSKILL's minesweeping launches (MSL's), and assisting deck force handling of helicopters.

This initial research report provides a comparative evaluation of the Group IV and non-Group IV samples, with respect to sample characteristics, training course achievement, and preliminary performance evaluations based on the initial four months of service aboard the CATSKILL. A subsequent report will provide detailed pre- and post-Pacific cruise performance evaluations across the range of general and specialized shipboard assignments. A follow-up of transferred personnel will also be included to complete the comprehensive evaluation of all unrated enlisted men originally assigned to the CATSKILL.

B. Research Procedures

1. General Methodology

The research objectives required comprehensive comparison data for both Group IV and non-Group IV personnel concerning pre-assignment information, training course results, and demonstrated shipboard performance. Accordingly, descriptive personnel data, consisting of aptitude test results and relevant biographical information, were obtained from the ship's personnel records. Performance

data comprising Enlisted Performance Record ratings, job assignment and transfer data, supervisory performance evaluations, advancement in rating information, and records of disciplinary offenses, were obtained on a continuing basis from supervisory and administrative personnel sources.

2. Subjects

The sample population considered in this study was delimited to include unrated enlisted personnel assigned to the CATSKILL at the time of the ship's recommissioning. The total group of 270 unrated men was divided into two samples on the basis of AFQT scores; one sample was composed of 116 Group IV men, (AFQT scores 10 through 30) and the other of 82 non-Group IV (AFQT score above 30) personnel. In order to keep the two samples as comparable and representative as possible, all men with more than 18 months service time, or older than 24 years of age, were eliminated from the samples. Deletions from the research samples amounted to 27% (N=72) of the total unrated enlisted personnel originally assigned, and included those men with enlisted service or age in excess of research limits, atypical work assignments (Stewards), and those for whom insufficient data were available.

3. Data Sources

Basic Test Battery scores, biographical information, advancements in rate, administrative actions, and Enlisted Performance Record results were transcribed from service records, with rate changes, transfers, and discharges being verified in the ship's diary. Initial shipboard assignments and indications of the early shipboard utility and proficiency of personnel in both Group IV and non-Group IV samples were determined through interviews with the supervisors of each ship division to which unrated enlisted men had been assigned.

Training achievement data for each man attending one or more of the package training courses were obtained from the CATSKILL's personnel records. The training courses were standard Navy enlisted skill courses conducted at the Naval Station, San Diego. Final course grades were determined on the basis of the average scores from written examinations. The following is a brief description of the content covered in each of the courses.

a. Basic Seamanship (K-000-612). This course included instruction in basic seaman terminology, marlinspike seamanship, types of riggings and methods of marking transfer stations.

b. Shipboard Fire Fighting (K-780-442). This course was designed to acquaint shipboard personnel with the elementary chemistry of fire, and the various methods which would enable the crew to extinguish shipboard fires in a minimum of time with the least amount of damage.

c. Engineering Auxiliaries (K-652-471). This course covered instruction in the construction, maintenance, repair, and operation of the auxiliary machinery installed in naval vessels. Content also included oil hydraulic systems, heat theory, distilling and refrigeration systems.

d. Engineroom Steam Machinery Construction, Operation, and Maintenance (K-651-453). This course instructed personnel in watch standing procedures, engineering log recording, and the theory of operation of engineroom steam machinery, pumps, turbines, propulsion shafts and bearings.

e. Basic Diesel Engines (K-652-458). This course covered diesel engine principles, fuel injection systems, and overall diesel engine operation and maintenance.

f. Damage Control Elements (K-780-401). This course included the basic procedures and knowledge of damage control with an emphasis on practical factors.

g. Basic Indoctrination in Nuclear, Biological, and Chemical Defense (K-780-420). This course instructed personnel in the nature of nuclear warfare, nature of biological and chemical attacks, detection and identification of nuclear, biological and chemical agents, individual and group protection, protective equipment and its use, decontamination and preparations for nuclear defense.

h. Practical Nuclear Defense (K-000-425). This course covered the fundamentals of nuclear energy, effects of nuclear weapons, and defense against nuclear radiation.

C. Results

The data presented include evaluative information for both samples, one composed of 116 Group IV personnel, and the other containing 82 non-Group IV men.

1. Sample Characteristics

a. Age, Education, and Length of Service. Table 1 presents, for both samples of the CATSKILL's unrated enlisted men, the means, mean differences, and standard deviations for age, length of formal education and the length of enlisted service at the time of evaluation. Even though attempts were made to keep the Group IV and non-Group IV samples comparable in age and length of service by limiting the research sample population to those who were less than 24 years old and with no more than 18 months of enlisted service, the Group IV personnel averaged 2.6 months less service, and were some eight months younger than the non-Group IV men. The samples also differed

TABLE 1

Comparison of Selected Pretraining Variable Means
for Group IV and non-Group IV Samples

Variable	Group IV Sample		Non-Group IV Sample		Difference Between Means	F-value
	N	Mean	N	Mean		
Age	115	19 yrs. 11 mos.	81	20 yrs. 7 mos.	8 mos.	16.2*
Years of Education	115	11.0 yrs.	80	12.3 yrs.	1.3 yrs.	12.0*
Length of Service	115	9.7 mos.	81	12.3 mos.	2.6 mos.	116.1*

Note.--

* Mean difference significant beyond the .001 level.

significantly in the amount of formal education obtained, with the non-Group IV sample averaging more than a year of education beyond that of the Group IV personnel.

b. Aptitude Test Scores. Mean aptitude test scores, standard deviations and mean differences for the two samples are contained in Table 2. The tests, except for the Armed Forces Qualification Test, are included in the Basic Test Battery, given early in recruit training. The average score on all aptitude tests was significantly higher for the non-Group IV sample than for the Group IV sample. The large mean difference on the AFQT was the result of defining samples on the basis of mutually exclusive ranges of AFQT scores. The highly significant mean differences on the remaining tests indicate consistent sample aptitude differences and are in agreement with numerous other studies. (1, 2, 3)

TABLE 2
Comparison of Aptitude Test Score Means
for Group IV and non-Group IV Samples

Aptitude Test	Group IV Sample			Non-Group IV Sample			Difference Between Means	F-value
	N	Mean	SD	N	Mean	SD		
AFQT	116	22.0	4.4	81	70.3	19.0	48.3	695.1*
GCT	116	41.2	7.5	81	57.3	7.6	16.1	178.6*
ARI	115	44.1	6.7	81	57.0	6.6	12.9	86.1*
MECH	115	44.5	6.4	81	53.8	7.6	9.3	21.5*
CLER	115	45.2	7.6	81	50.2	7.6	5.0	24.1*
SONAR	114	47.0	9.0	72	53.8	9.6	6.8	58.1*
RADIO	115	48.1	8.8	77	58.4	9.5	10.3	146.8*
ETST	114	45.3	8.1	71	59.8	7.5	14.5	121.8*

Note.--

* Mean difference significant beyond the .001 level.

2. Training Achievement

Final course grades for the package training courses attended during the precommissioning period were obtained for each man completing one or more courses. The course grades were assigned on the basis of average scores on written examinations. Average course grades for the samples are shown in Table 3, along with standard deviations, differences between sample means, and results of tests for significance. The Group IV sample averaged significantly lower grades, than the non-Group IV sample in all eight courses for which data were available.

3. Relationship Between Pretraining Variables and Training Course Grades

In order to determine the relationship between selected pretraining variables and training course grades, Pearson product-moment correlation coefficients were computed for the combined sample of Group IV and non-Group IV personnel. Correlation coefficients between all eight training course grades and six pretraining variables are shown in Table 4. All but eight of the 48 correlations were significant at the .01 level, indicating a general relationship between performance on the aptitude tests and in the training courses, for the combined sample containing personnel with all levels of aptitudes. Both AFQT and GCT yielded significant correlations with the grades from all training courses, and Shop Practice scores were significantly related to grades in all courses except Basic Indoc-trination in Nuclear, Biological, and Chemical Defense.

Table 5 includes the same variables as the previous table, with correlations between pretraining variables and training course grades, computed for the Group IV sample alone. The lower correlation coefficients reflect the restricted range of scores available from the Group IV sample. AFQT scores within the range of the Group IV sample are significantly related to performance in the Basic Diesel Engines course only. Correlations between the training course grades and years of education although not significant for all courses, were more consistent across courses than the correlations for other more restricted pretraining variables.

4. Shipboard Performance Evaluations

a. Professional Performance: Enlisted Performance Record.

Professional performance scores were obtained from the Enlisted Performance Records for personnel in both samples. The scores used in the statistical analysis consisted of the first set of quarterly marks recorded for each man after his arrival aboard the CATSKILL. Mean professional performance scores, standard deviations and significance test results are contained in Table 6 for the Group IV and non-Group IV samples. Although the absolute mean score

TABLE 3

Comparison of Mean Training Course Grades for
Group IV and non-Group IV Samples

Training Course	Group IV		Non-Group IV		Difference Between Means		F-value
	N	Mean	SD	N	Mean	SD	
a Basic Seamanship	82	72.7	13.4	11	89.0	8.4	15.3**
b Firefighting	52	74.0	9.9	10	89.1	10.0	19.4**
c Engineering Auxiliaries	21	46.5	13.5	6	75.8	12.0	23.2**
d Engineroom Steam Machinery	13	55.1	15.4	5	76.4	4.9	8.9*
e Basic Diesel Engines	18	50.4	13.2	5	78.0	6.8	19.7**
f Damage Control Elements	85	65.7	10.7	39	79.7	9.7	47.7**
g Basic Indoctrination in Nuclear, Biological & Chemical Defense	12	66.3	9.7	4	85.0	3.5	13.5*
h Practical Nuclear Defense	94	66.5	10.6	42	82.7	8.9	74.9**

Note.--

* Mean difference significant beyond .01 level.

** Mean difference significant beyond .001 level.

TABLE 4

Correlations Between Selected Pretraining Variables and Training Course Grades
for the Combined Sample of Group IV and non-Group IV Personnel

Pretraining Variable	Training Course**							
	Course a N=93	Course b N=62	Course c N=27	Course d N=17	Course e N=22	Course f N=122	Course g N=18	Course h N=134
AFQT	.41*	.40*	.72*	.53*	.76*	.52*	.65*	.56*
GCT	.40*	.46*	.61*	.70*	.65*	.54*	.63*	.57*
ARI	.43*	.40*	.26	.38	.76*	.50*	.25	.59*
MECH	.27*	.30*	.61*	.33	.52*	.36*	.34	.32*
Shop Practice	.41*	.45*	.64*	.54*	.56*	.40*	.19	.41*
Years of Education	.29*	.35*	.46*	.51	.50*	.35*	.44	.44*

Note.--

* Correlation significant at the .01 level; determined for the appropriate N.

** Identifying course letters correspond to the course letters assigned in Table 3.

TABLE 5
Correlations Between Selected Pretraining Variables and Training Course Grades
for the Group IV Personnel

Pretraining Variable	Training Course**							
	Course a N=81	Course b N=51	Course c N=21	Course d N=13	Course e N=18	Course f N=84	Course g N=12	Course h N=94
AFQT	.24	.22	-.06	-.32	.55*	.11	.16	.03
GCT	.24	.37*	.08	.50	.33	.38*	.18	.28*
ARI	.33*	.26	-.33	.03	.54*	.23	.06	.35*
MECH	.11	.38*	.00	.00	.42	.05	-.10	-.19
Shop Practice	.28*	.32*	.20	.28	.14	.12	-.36	.09
Years of Education	.19	.26	.32	.33	.32	.29*	.39	.29*

Note.--

* Correlation significant at the .01 level; determined for the appropriate N.

** Identifying course letters correspond to the course letters assigned in Table 3.

difference was numerically small, the Group IV personnel were rated significantly lower in professional performance than the non-Group IV men. Professional performance marks are undoubtedly influenced, to an undetermined extent, by rate and length of time in service.

TABLE 6
Comparison of Mean Professional Performance Scores
for Group IV and non-Group IV Samples

	Group IV			Non-Group IV			Difference Between Means	F-value
	N	Mean	SD	N	Mean	SD		
Professional Performance	90	3.5	.3	67	3.7	.3	0.2	15.3*

Note.--

* Mean difference significant beyond the .001 level.

b. Advancement in Rate. A record of all changes in rate was maintained for the unrated personnel during the four month period following recommissioning of the CATSKILL. Advancements in rate reflect performance proficiency in so far as they demonstrate satisfactory completion of qualifications for rate advancement, in addition to requisite minimum time in service. Qualifications include adequate scores on the appropriate advancement examination, and maintenance of acceptable military and personal behavior. Table 7 presents three successive comparisons of distributions of rate for the Group IV and non-Group IV samples. The first pair of distributions in the table shows the allocation of rates at the time of initial assignment to the CATSKILL. The second and third sets of distributions indicate the dispersion of rates after successive two month intervals. Percentages represent the proportion of personnel achieving a rate advancement, based on the number of men remaining in each sample at the time the data were recorded. Succeeding sample totals were reduced by the number of men who had been discharged or transferred during the preceding two month interval.

At the time of initial assignment to the CATSKILL, the majority of both samples were Seaman or Fireman Apprentices (E-2), however, 43% of the non-Group IV sample were rated as Seaman or Fireman (E-3), while only 1% of the Group IV sample had attained that rate. After two months of shipboard service 81% of the non-Group IVs, as opposed

TABLE 7

Comparison of Rate Distributions for the Group IV
and non-Group IV Samples

Evaluation	Group IV Sample						Non-Group IV Sample											
	SA/FA (E-2)		SN/FN (E-3)		Third Class (E-4)		Total assigned to ship		SA/FA (E-2)		SN/FN (E-3)		Third Class (E-4)		Total assigned to ship		Trans- ferred	
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)
1. Time of assignment to CATSKILL	134	(99)	1	(01)	0	(00)	135	0	47	(57)	35	(43)	0	(00)	82	0	0	
2. Two months later	54	(47)	62	(53)	0	(00)	116	19	11	(13)	66	(81)	5	(06)	82	0	0	
3. Four months later	25	(23)	84	(77)	0	(00)	109	7	3	(04)	64	(81)	12	(15)	79	3	3	

Note.--

* All percentages were determined on the basis of the total number of men remaining in each sample.

to 53% of the Group IVs, were rated as Seaman or Fireman (E-3). After four months aboard the CATSKILL, 15% of the non-Group IVs had advanced to the rate of third class petty officer (E-4), while none of the Group IVs had advanced beyond the Seaman (E-3) level. In addition, 19% of the original total of Group IVs had been transferred or discharged, while less than 4% of the non-Group IVs had left the CATSKILL.

It should be noted that while the comparative data of Table 7 indicate concurrent differences between the samples in rate distributions, the non-Group IV sample has served an average of 2.6 more months in the Navy than the Group IV personnel. In order to correct for the differences in length of service, the non-Group IV rate distribution at time of assignment to the CATSKILL should be compared with the Group IV rate distribution two months after initial ship assignment. In this comparison, the rate distributions appear more similar, with the Group IV sample having 47% and 53% of the personnel rated as E-2's and E-3's, respectively, and the non-Group IV sample having 57% and 43% rated as E-2's and E-3's. Again, a similarity in rate distributions is apparent when the two-month non-Group IV distribution is compared with the four-month Group IV distribution, although 6% of the non-Group IV sample had been advanced to third class petty officer (E-4), while none of the Group IV men had made E-4. The final report will include more definitive information regarding the relationship between AFQT and rate, since the effective difference in length of service will have diminished, as a result of longer total lengths of service.

c. Discipline Problems. All incidents resulting in either civil or military action were recorded for both samples during the four-month period following the ship's recommissioning. The recorded incidents which had elicited judicial intervention involved primarily, drunkenness, bad debts, and unauthorized absences from military duty. Table 8 compares the frequency of discipline problems for the two samples. At least one incident was recorded for 31% of the Group IV sample, while only 14% of the non-Group IV sample were involved in one or more discipline problems. Only 4% of the non-Group IV sample were involved in two situations and no non-Group IV man was implicated in more than two incidents. The relative frequency of discipline problems may have been affected by differences between the samples in length of service. Additional data in a subsequent report will provide comparative statistics based on longer total periods of service.

d. Performance Ratings. Group performance characteristics of the two samples were obtained through interviews conducted with the leading petty officer, i. e. supervisor, of each ship division which had been assigned unrated men. The three divisions which had utilized the majority of the unrated personnel were the Deck Force, Boat Group, and the Engineering Division. The responses of the supervisors of these divisions indicated that in spite of different lengths of

TABLE 8

Comparison of the Number of Recorded Discipline Problems
Experienced by the Group IV and non-Group IV Samples

No. of Incidents Per Man	Group IV		Non-Group IV	
	Number of Men	% Total Sample	Number of Men	% Total Sample
0	80	69	71	86
1	28	24	8	10
2	6	5	3	4
3	1	1	0	0
4	1	1	0	0
Totals	116	100	82	100

service, most unrated men had satisfactorily performed the jobs to which they had been assigned, regardless of whether they were of Group IV or non-Group IV classification. However, the supervisors noted that the Group IV personnel appeared to have required more supervision and repeated instruction in job responsibilities, than the non-Group IV men.

D. Conclusions

This investigation was designed to evaluate the performance capabilities of a large sample of Mental Group IV personnel in comparison with the capabilities of non-Group IV men aboard an operational Navy ship, USS CATSKILL. However, conclusions based on the current data must be qualified in terms of the difference between samples in average length of service. A final report, with more detailed information based on longer total lengths of service, will provide comparisons less influenced by sample differences in service time.

The purpose of this interim report is to provide descriptive data regarding the samples, relative training achievement information, and results of preliminary performance evaluations. On the basis of this initial information, the following conclusions are presented.

1. Of the unrated men comprising the research population, the Group IV sample had, on the average, a lower chronological age, shorter length of formal education, and a shorter length of elapsed enlisted service than the non-Group IV sample.

2. The Group IV sample averaged significantly lower scores than the non-Group IV sample on all aptitude tests in addition to AFQT (GCT, ARI, MECH, CLER, SONAR, RADIO, ETST, and Shop Practices).

3. The Group IV sample received significantly lower average grades than the non-Group IV sample in eight package training courses.

4. Correlations between training course grades and pretraining variables did not reveal significant nor consistent relationships when based on the restricted range of the Group IV sample only.

5. The average job performance of the Group IV sample, as rated on the Enlisted Performance Record, was significantly lower than the performance of the non-Group IV sample.

6. The distribution of rates at the time of initial crew assignment and at two subsequent assessment intervals indicated a generally lower level of rate for the Group IV personnel than for the non-Group IV sample. Correction for the difference between samples in average length of service diminished the apparent differences in rate distributions between the two samples. However, none of the Group IV sample had advanced to the level of third class petty officer (E-4) after four months aboard ship while 15% of the non-Group IV sample had achieved that rate.

7. The Group IV sample experienced more discipline problems than the non-Group IV sample during the four month evaluation period.

8. The Group IV personnel were rated by their supervisors as being generally as proficient on the job as the non-Group IV personnel, although the Group IV men reportedly required more and closer supervision.

The evaluation of the unrated personnel aboard the CATSKILL will be continued to determine the effects of additional shipboard service time and operational cruise conditions upon the relative performance capabilities of the two samples. Future assessments should establish the extent to which a large sample of Group IV personnel may be successfully integrated into the crew of an operational ship.

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11. SUPPLEMENTARY NOTES		12. SPONSORING MILITARY ACTIVITY	
		Chief of Naval Personnel (Pers-A3) Navy Department Washington, D. C. 20370	
13. ABSTRACT			
<p>An evaluation was made of the capabilities and utilization of Group IV personnel aboard an operational Navy vessel (USS CATSKILL MCS-1). Assessments were made of a Group IV sample (N=116) and a comparison non-Group IV sample (N=82) in terms of aptitudes and experiential factors, training achievement, and preliminary shipboard performance. (U)</p> <p>The results indicate that the Group IV sample had significantly less formal education, lower chronological age, and a shorter length of enlisted service, than the non-Group IV personnel. The Group IV sample averaged significantly lower aptitude test scores and lower professional performance scores than the non-Group IV sample. In addition, more discipline problems and lower supervisory ratings were recorded for the Group IV sample than the non-Group IV personnel. (U)</p> <p>A pre- and post-cruise evaluation will be conducted to determine the extent to which the sample of Group IV personnel are successfully integrated into the crew of the CATSKILL. (U)</p>			

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